Homework 6: Logical Operators

CS 1323 Fall 2023

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1. (15 points; 3 points each part) Given the variable assignments below, is each logical expression true or false? If the statement is not legal in Java, say so. **Show your work step by step. Answers alone will not receive credit since they can be calculated by eclipse. If a logical operator shortcuts, say so.**

```
int little = 6;
int big = 2;
int size1 = 5;
int size2 = 9;
```

a) (little > big) && (size2 > big)

(6 > 2) && (9 > 2)
The expression true because both operands are tru, 6 is greater than 2 and 9 is also greater than 2.

b) size1 < size2 || big < little && size2 == big

5 < 9 || 2 < 6 && 9 == 2
The expression is true because 5 < 9 is true and when using || the result of operand will always be true since the second operand isn't evaluated

c) ! little < big

!6 < 2
The expression is true since the 6 < 2 is false

d) little < size1 || little < size2 || little > big

6 < 5 || 6 < 9 || 6 > 2
The expression is true since one of the operands is true

e) 0 <= size1 <= 10

0 <= 5 <= 10
This statement is not legal in java.

2. (5 points; 3 points each for a) and 2 points for b)) Translate each statement below into a boolean expression that is legal in Java. Use the given variable. Pay careful attention to boundary conditions (e.g. < versus <=). **Make your expressions as clear and simple to understand as possible, using DeMorgan's Law if necessary.**

int percent;

a) percent is either odd and between 90 and 100 or percent is even and between 80 and 90.

```
((percent % 2 == 1) && (percent > 90 && percent < 100) || (percent % 2 == 0) &&
(percent > 80 && percent < 90))
```

b) percent is not between 0 and 100 (inclusive)

```
!(percent >= 0 && percent <= 100)
```